

- 16 -

## What is Claimed:

- 1                   1.       A method for use in a cable television receiver to switch from a non-  
2       module tuning mode to a module tuning mode, the method comprising the steps of:  
  
3                   detecting a cable tuning module in the cable television receiver;  
  
4                   acquiring module tuning data responsive to the detection of the cable tuning  
5       module; and  
  
6                   switching from the non-module tuning mode to the module tuning mode  
7       responsive to a measure of the acquired module tuning data.
- 1                   2.       The method of claim 1, wherein the switching step comprises the  
2       steps of:  
  
3                   determining if the acquired module tuning data enables the cable television  
4       receiver to tune at least a predetermined number of channels; and  
  
5                   switching from the non-module tuning mode to the module tuning mode  
6       when the cable television receiver is able to tune at least the predetermined number of  
7       channels.
- 1                   3.       The method of claim 1, wherein the cable television receiver is  
2       configured to tune channels for viewing by a user and wherein the switching step  
3       comprises the steps of:  
  
4                   determining if the acquired module tuning data enables the cable television  
5       receiver to tune at least a predetermined number of channels;  
  
6                   soliciting user input to switch from the non-module tuning mode to the  
7       module tuning mode when the cable television receiver is able to tune at least the  
8       predetermined number of channels; and

- 17 -

switching from the non-module tuning mode to the module tuning mode responsive to the solicited user input.

4. The method of claim 1, wherein the switching step comprises the steps of:

calculating a module quality factor based at least in part on a number of channels that may be tuned using the acquired module tuning data; and

switching from the non-module tuning mode to the module tuning mode automatically responsive to the module quality factor having a value greater than a threshold value.

5. The method of claim 4, wherein the module quality factor equals:

$NTC + ET/TSF$ ;

where NTC is the number of channels that may be tuned based on the acquired module tuning data, ET is elapsed time since the cable tuning module was detected, and TSF is a time scale factor.

6. The method of claim 1, wherein the acquiring step comprises the step of:

acquiring a first instance of each table within a set of critical tables, the set of critical tables enabling the tuning of at least one channel; and

wherein the switching step comprises the step of:

switching from the non-module tuning mode to the module tuning mode responsive to the acquisition of the first instance of each table within the set of critical tables.

- 18 -

1                   7.     The method of claim 6, wherein the step of acquiring the first  
2 instance of each table within the set of critical tables comprises the steps of:

3                   acquiring a Carrier Definition Sub-table, the Carrier Definition Sub-table  
4 defining actual frequencies of one or more channels;

5                   acquiring a Modulation Mode Sub-table, the Modulation Mode Sub-table  
6 defining modulation schemes for the one or more channels;

7                   acquiring a Defined Channels Map table, the Defined Channels Map defining  
8 one or more virtual channels for use by the cable television receiver when in the module  
9 tuning mode; and

10                  acquiring a Virtual Channels Map table, the Virtual Channels Map table  
11 identifying a virtual channel record for each of the defined virtual channels, each virtual  
12 channel record identifying an actual frequency defined by the Carrier Definition Sub-table  
13 and a modulation scheme defined by the Modulation Mode Sub-table.

1                   8.     The method of claim 1, further comprising the step of:

2                   presenting a virtual channel reference number corresponding to a currently  
3 tuned physical channel responsive to switching from the non-module tuning mode to the  
4 module tuning mode.

1                   9.     The method of claim 1, further comprising the step of:

2                   tuning to a virtual channel corresponding to a previously tuned physical  
3 channel responsive to switching from the non-module tuning mode to the module tuning  
4 mode.

1                   10.    A cable television receiver apparatus comprising:

2                   a module interface configured to receive a cable tuning module; and

- 19 -

3 a processor coupled to the module interface; the processor configured to  
4 detect a module inserted in the module interface, acquire module tuning data from the  
5 module responsive to the detection of the module, and switch from a non-module tuning  
6 mode to a module tuning mode responsive to a measure of the acquired module tuning  
7 data.

1 11. The apparatus of claim 10, wherein the processor is further  
2 configured to determine if the acquired module tuning data enables at least a  
3 predetermined number of channels to be tuned and switches from the non-module tuning  
4 mode to the module tuning mode when the cable television receiver is able to tune at least  
5 the predetermined number of channels.

1 12. The apparatus of claim 10, further comprising:

2 a presentation device coupled to the processor that presents a solicitation  
3 graphic soliciting user input to switch from the non-module tuning mode to the module  
4 tuning mode;

5 wherein the processor is further configured to tune channels for viewing by a  
6 user, determine if the acquired module tuning data enables at least a predetermined  
7 number of channels to be tuned, and present the user with the solicitation graphic when  
8 the processor is able to tune at least the predetermined number of channels and wherein  
9 the processor switches from the non-module tuning mode to the module tuning mode  
10 responsive to the solicited user input.

1 13. The apparatus of claim 10, wherein the processor is further  
2 configured to calculate a module quality factor based at least in part on a number of  
3 channels that may be tuned using the acquired module tuning data and switches from the  
4 non-module tuning mode to the module tuning mode automatically responsive to the  
5 module quality factor having a value greater than a threshold value.

1 14. The apparatus of claim 13, wherein the module quality factor equals:

2  $NTC + ET/TSF$ ;

- 20 -

3                   where NTC is the number of channels that may be tuned based on the  
4                   acquired module tuning data, ET is elapsed time since the cable tuning module was  
5                   detected, and TSF is a time scale factor.

1                   15.     The apparatus of claim 10, wherein the processor is configured to  
2                   acquire a first instance of each table within a set of critical tables, the set of critical tables  
3                   enabling the tuning of at least one channel, and the processor switches from the non-  
4                   module tuning mode to the module tuning mode responsive to the acquisition of the first  
5                   instance of each table within the set of critical tables.

1                   16.     The apparatus of claim 15, wherein the set of critical tables  
2                   comprises:

3                   a Carrier Definition Sub-table, the Carrier Definition Sub-table defining  
4                   actual frequencies of one or more channels;

5                   a Modulation Mode Sub-table, the Modulation Mode Sub-table defining  
6                   modulation schemes for the one or more channels;

7                   a Defined Channels Map table, the Defined Channels Map defining one or  
8                   more virtual channels for use by the cable television receiver when in the module tuning  
9                   mode; and

10                  a Virtual Channels Map table, the Virtual Channels Map table identifying a  
11                  virtual channel record for each of the defined virtual channels, each virtual channel record  
12                  identifying an actual frequency defined by the Carrier Definition Sub-table and a  
13                  modulation scheme defined by the Modulation Mode Sub-table.

1                   17.     The apparatus of claim 10, further comprising:

2                   a presentation device coupled to the processor;

- 21 -

3                    wherein the processor is configured to present a virtual channel reference  
4                    number on the presentation device corresponding to a currently tuned physical channel  
5                    responsive to switching from the non-module tuning mode to the module tuning mode.

1                    18.     The apparatus of claim 10, wherein the processor is configured to  
2                    tune to a virtual channel corresponding to a previously tuned physical channel responsive  
3                    to switching from the non-module tuning mode to the module tuning mode.

1                    19.     A system for use in a cable television receiver to switch from a non-  
2                    module tuning mode to a module tuning mode, the system comprising:

3                    means for detecting a cable tuning module in the cable television receiver;

4                    means for acquiring module tuning data responsive to the detection of the  
5                    cable tuning module; and

6                    means for switching from the non-module tuning mode to the module tuning  
7                    mode responsive to a measure of the acquired module tuning data.

1                    20.     The system of claim 19, wherein the switching means comprises:

2                    means for determining if the acquired module tuning data enables the cable  
3                    television receiver to tune at least a predetermined number of channels; and

4                    means for switching from the non-module tuning mode to the module tuning  
5                    mode when the cable television receiver is able to tune at least the predetermined number  
6                    of channels.

1                    21.     The system of claim 19, wherein the cable television receiver is  
2                    configured to tune channels for viewing by a user and wherein the switching means  
3                    comprises:

4                    means for determining if the acquired module tuning data enables the cable  
5                    television receiver to tune at least a predetermined number of channels;

- 22 -

6 means for soliciting user input to switch from the non-module tuning mode  
7 to the module tuning mode when the cable television receiver is able to tune at least the  
8 predetermined number of channels; and

9 means for switching from the non-module tuning mode to the module tuning  
10 mode responsive to the solicited user input.

1 22. The system of claim 19, wherein the switching means comprises:

2 means for calculating a module quality factor based at least in part on a  
3 number of channels that may be tuned using the acquired module tuning data; and

4 means for switching from the non-module tuning mode to the module tuning  
5 mode automatically responsive to the module quality factor having a value greater than a  
6 threshold value.

1 23. The system of claim 19, wherein the acquiring means comprises:

2 means for acquiring a first instance of each table within a set of critical  
3 tables, the set of critical tables enabling the tuning of at least one channel; and

4 wherein the switching means comprises:

5 means for switching from the non-module tuning mode to the module tuning  
6 mode responsive to the acquisition of the first instance of each table within the set of  
7 critical tables.

1 24. The system of claim 19, further comprising:

2 means for presenting a virtual channel reference number corresponding to a  
3 currently tuned physical channel responsive to switching from the non-module tuning  
4 mode to the module tuning mode.

1 25. The system of claim 19, further comprising:

- 23 -

2 means for tuning to a virtual channel corresponding to a previously tuned  
3 physical channel responsive to switching from the non-module tuning mode to the module  
4 tuning mode.

1 26. A computer readable carrier including software that is configured to  
2 control a computer to implement a method embodied in a computer readable medium for  
3 use in a cable television receiver to switch from a non-module tuning mode to a module  
4 tuning mode, the method including the steps of:

5 detecting a cable tuning module in the cable television receiver;

6 acquiring module tuning data responsive to the detection of the cable tuning  
7 module; and

8 switching from the non-module tuning mode to the module tuning mode  
9 responsive to a measure of the acquired module tuning data.

1 27. The computer readable carrier of claim 26, wherein the switching  
2 step for implementation by the computer comprises the step of:

3 determining if the acquired module tuning data enables the cable television  
4 receiver to tune at least a predetermined number of channels; and

5 switching from the non-module tuning mode to the module tuning mode  
6 when the cable television receiver is able to tune at least the predetermined number of  
7 channels.

1 28. The computer readable carrier of claim 26, wherein the cable  
2 television receiver is configured to tune channels for viewing by a user and wherein the  
3 switching step for implementation by the computer comprises the step of:

4 determining if the acquired module tuning data enables the cable television  
5 receiver to tune at least a predetermined number of channels;



- 24 -

soliciting user input to switch from the non-module tuning mode to the module tuning mode when the cable television receiver is able to tune at least the predetermined number of channels; and

switching from the non-module tuning mode to the module tuning mode responsive to the solicited user input.

29. The computer readable carrier of claim 26, wherein the switching step for implementation by the computer comprises the step of:

calculating a module quality factor based at least in part on a number of channels that may be tuned using the acquired module tuning data; and

switching from the non-module tuning mode to the module tuning mode automatically responsive to the module quality factor having a value greater than a threshold value.

30. The computer readable carrier of claim 29, wherein the calculating step for implementation by the computer comprises the step of:

calculating  $NTC + ET/TSF$ ;

where NTC is the number of channels that may be tuned, ET is elapsed time since the cable tuning module was detected, and TSF is a time scale factor.

31. The computer readable carrier of claim 26, wherein the acquiring step for implementation by the computer comprises the step of:

acquiring a first instance of each table within a set of critical tables, the set of critical tables enabling the tuning of at least one channel; and

wherein the switching step for implementation by the computer comprises the step of:

- 25 -

7                   switching from the non-module tuning mode to the module tuning mode  
8   responsive to the acquisition of the first instance of each table within the set of critical  
9   tables.

1                   32.    The computer readable carrier of claim 26, wherein the method  
2   implemented by the computer further includes the step of:

3                   presenting a virtual channel reference number corresponding to a currently  
4   tuned physical channel responsive to switching from the non-module tuning mode to the  
5   module tuning mode.

1                   33.    The computer readable carrier of claim 26, wherein the method  
2   implemented by the computer further includes the step of:

3                   tuning to a virtual channel corresponding to a previously tuned physical  
4   channel responsive to switching from the non-module tuning mode to the module tuning  
5   mode.